The elaboration of microscopical technique in the nineteenth century, leading to the discovery of the cell, with its nucleus and chromosomes, afforded conclusive evidence that ovum and spermatozoon contribute more or less equally to the organisation of the new individual, and placed upon a secure foundation the fundamental generalisation that both are cell-units. Exactly how they co-operate in initiating development is the problem discussed by Prof. Lillie, in the light both of his own observations and of those of a small army of fellow-workers in the same field, pre-eminent amongst whom stand out the names of Hertwig, Fol, Boveri, Delage, Loeb, and E. B. Wilson.

There is one fact of fundamental importance about which all observers seem now to be agreed, and that is the twofold character of the process of normal fertilisation; not only does it stimulate the egg to develop, it also results in the combination of maternal and paternal chromosomes in the zygote nucleus. This combination is of the most far-reaching significance for the theory of heredity, but it appears to have little or nothing to do with the "activation" of the ovum which leads to development, and is only incidentally referred to in the volume before us.

As to how the activation is effected, there seem to be almost as many views as there are observers. It is well known, however, that activation can take place without the aid of a spermatozoon, and that artificial parthenogenesis may be brought about by a great variety of methods, involving the application of chemical or physical stimuli. The problem is one of physiological chemistry, and apparently many factors may be concerned in the process. The secretion of a substance by the egg. which causes the spermatozoa to agglutinate and adhere to the surface, appears to be one of the most important. The formation of the so-called "fertilisation-membrane" as a result of the impact of the spermatozoon and the consequent cortical changes that take place in the ovum are fully discussed, and the hypothesis is put forward that a substance ("fertilizin") exists in the cortex which exerts a ferment-like action as it penetrates into the egg, or is carried in by the spermatozoon, and it is suggested that the spermatozoon itself requires to be "fertilised" by passing through the cortex before it can play its proper part in the events which take place internally and lead to development.

The book contains a vast amount of information as to recent discoveries and theories, and will serve as a very useful guide to those who wish to follow up this most intricate subject. A. D.

Wisdom of Life and Existence.

A Gentle Cynic: Being a Translation of the Book of Koheleth, commonly known as Ecclesiastes, stripped of Later Additions; also its Origin, Growth, and Interpretation. By Prof. Morris Jastrow, jun. Pp. 255. (Philadelphia and London: J. B. Lippincott Co., 1919.) Price 9*s*. net.

PROF. MORRIS JASTROW, jun., of the University of Pennsylvania, is well known among scholars as one of the best equipped analysts and interpreters of Biblical lore. In this volume he has taken the Book of Koheleth in its origin, growth, and interpretation, and thrown a good deal of fresh light on the subject.

In a foreword of twenty pages is given a very able sketch of the main principles of Biblical criticism and of the enormous gain which accrues from a knowledge and acceptation of them. By such means only are we able to pass from the realm of confusion to that of clearness. In our generation alone has the religious portion of mankind come to realise this necessity, and even to-day the realisation is but a portion of a small minority. Yet only by the adoption of scientific methods can the past be illumined in the realm of religion, as it has been illumined in every other field.

The author passes on to examine the origin and structure of the Book of Koheleth. Here he arrives at the conclusion that the book, as we possess it to-day, is an expanded and edited rendering of an earlier version, which, when it is viewed without the accretions, presents a gentle criticism of human life and existence. The version knows nothing of what lies behind or before us. It really deals with man's passage through life, and emphasises the present infinitely more than either the past or the future. Man is asked to make the most of the good things that Nature brings to him; he is warned not to worry about speculative things, such as his own final goal or the destiny of the universe. In spite of much that is hidden, life has a meaning here and now; it has enjoyments which make it worth while to live.

Now, it is evident that such an empirical, Epicurean view of life would never do as a *religious* interpretation of the universe or of life itself. As it stood originally, the Book of Koheleth had no chance of entering into the sacred books. It is therefore edited, added to, and polished so as to furnish here and there pious injunctions of rewards and punishments in order that the life

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of the present may be lived in accordance with "ideal ends." God and the future are brought in as the norms to which life has to conform.

This portion of the book is a brilliant piece of work, and the author has brought to bear upon it not only great learning, but also a lightness of touch which really borders on something like originality. In the hands of men such as Prof. Jastrow, the Bible can again become a work of immense significance.

The next part of the book presents us with the words of Koheleth in their original form, stripped of later interpolations, sayings, and comments. The translation of Koheleth is excellent, and in reading it we seem to be brought face to face with a book published yesterday, because it looks upon the world of Nature and of life from a point of view which cannot be neglected. Of course, such aspects do not exclude others, but it is always well to make the best use of each point of view, and not to try to form a composite so vague that no meaning can be extracted from it. No doubt Prof. Jastrow had something like this in mind when he undertook the preparation of this volume, and we sincerely hope he will deal with other composite books of the Old Testament as he has done so splendidly with the Book of Koheleth.

New Books on Industrial Chemistry.

(1) *Applied Chemistry: A Practical Handbook for Students of Household Science and Public Health.* By Dr. C. Kenneth Tinkler and Helen Masters. Vol. i., *Water, Detergents, Textiles, Fuels, etc.* Pp. xii + 292. (London: Crosby Lockwood and Son, 1920.) Price 12*s.* 6*d.* net.

(2) *Chemistry from the Industrial Standpoint.* By P. C. L. Thorne. (New Teaching Series.) Pp. xvi + 244. (London: Hodder and Stoughton, 1919.) Price 4*s.* 6*d.* net.

(3) *Fuel, Water, and Gas Analysis for Steam Users.* By John B. C. Kershaw. Second edition, revised and enlarged. Pp. xii + 201. (London: Constable and Co., Ltd., 1919.) Price 12*s.* 6*d.* net.

(4) *Popular Chemical Dictionary.* By C. T. Kingzett. Pp. vi + 368. (London: Baillière, Tindall, and Cox, 1920.) Price 15*s.* net.

(1) THIS work is mainly intended for students in their third year who are preparing for diplomas in household and social science, and for diplomas and degrees in public health of the various universities. There is no work known to the reviewer that covers the ground in the same manner as this. The book is clearly and attractively written, and forms a most useful addition, not only to the academic student, but also to the works chemist, who must often adjudicate upon matters such as are dealt with in this work.

The book does not deal with manufacturing operations, but gives a clear and practical exposition (with the necessary theoretical explanations) of the methods employed in analysing and appraising the value of water, water softening processes, soap, textile fibres, bleaching agents, dry cleaning, air analysis, gaseous fuels, liquid and solid fuels, materials used in the protection of wood, metallic and other surfaces, etc. Although the authors themselves make no claim to originality, many of the subjects are treated in a manner very different from that prevailing in most of the existing works on the subject. Every technical chemist should possess a copy of this work for reference, as there is collected together here in one volume a large mass of material which is usually scattered piecemeal throughout a number of expensive treatises. Altogether this is a book to be thoroughly recommended, and it should command a wide sale.

(2) Mr. Thorne has written an interesting little book on a very large subject, which is clearly and attractively explained, and the volume marks a considerable departure from the older style of text-book. Not very long ago a book of this type would have enjoyed no sale, but would have been coldly received in scientific circles, and the advent of such a work shows what a revolution has been wrought in the chemical world within the last few years. The reviewer cannot help thinking, however, that Dr. Briscoe's excellent introduction is somewhat hard upon the business man. His own experience is that the business world is very much alive to scientific possibilities, whereas the purely professional university-trained chemist of the past was not only largely unpractical, but also held himself aloof from the problems of the business man, and the latter's caution was founded in many cases upon heavy losses attained by contact with the semi-scientific "expert," who regards the business man as his natural prey.

For the earnest technical student or the trained works chemist the book naturally is not of great use, as it cannot go into exact detail. For a young chemist, however, entering works for the first time, it gives an excellent summary of the main operations involved in chemical industry, and is well up-to-date as regards modern develop-

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